

=> d his

(FILE 'HOME' ENTERED AT 09:15:03 ON 31 JAN 2007)  
FILE 'CA' ENTERED AT 09:15:17 ON 31 JAN 2007  
E GAINES G/AU  
L1 149 S E3,E7-8,E13,E16-22  
FILE 'REGISTRY' ENTERED AT 09:18:50 ON 31 JAN 2007  
L2 1 S 7440-57-5  
SEL NAME L2  
FILE 'CA' ENTERED AT 09:20:05 ON 31 JAN 2007  
L3 4 S L1 AND (L2 OR E1-32)  
L4 45 S L1 AND (MONOLAYER OR MULTILAYER)  
L5 2 S L4 AND(COLLOID? OR PARTICLE OR PARTICULATE)  
FILE 'REGISTRY' ENTERED AT 09:24:43 ON 31 JAN 2007  
L6 508 S DOCOSYLAMINE OR OCTADECYLAMINE  
FILE 'CA' ENTERED AT 09:25:24 ON 31 JAN 2007  
L7 11289 S L6 OR DOCOSYLAMINE OR OCTADECYLAMINE  
L8 129 S L7(8A) (GOLD OR AU OR SILVER OR AG OR PLATINUM OR PT OR PALLADIUM  
OR PD)  
L9 57 S L8 AND PY<1998  
L10 46 S L3-5 AND PY<1998  
L11 6 S L10 AND(GOLD OR AU OR SILVER OR AG OR PLATINUM OR PT OR PALLADIUM  
OR PD)  
L12 62 S L9,L11

=> d bib,ab l12 1-62

L12 ANSWER 7 OF 62 CA COPYRIGHT 2007 ACS on STN  
AN 127:100166 CA  
TI Langmuir-Blodgett Films of Carboxylic Acid Derivatized Silver Colloidal  
Particles: Role of Subphase pH on Degree of Cluster Incorporation  
AU Sastry, Murali; Mayya, K. S.; Patil, V.; Paranjape, D. V.; Hegde, S. G.  
CS Materials Chemistry and Catalysis Divisions, National Chemical  
Laboratory, Pune, 411 008, India  
SO Journal of Physical Chemistry B (1997), 101(25), 4954-4958  
AB The authors demonstrate that reasonably ordered multilayer films of  
silver clusters can be deposited by the Langmuir-Blodgett (LB)  
technique. The approach consists of electrostatically immobilizing neg.  
charged carboxylic acid derivatized silver colloidal particles at the  
air-water interface using pos. charged fatty amine Langmuir monolayers.  
The degree of cluster incorporation into the Langmuir monolayer has been  
controlled by varying the charge on the amine mols. through the  
colloidal subphase pH. Pressure-area isotherms were used to follow  
adsorption of the silver colloidal particles at the amine surface, while  
quartz crystal microgravimetry (QCM), optical absorption spectroscopy,  
IR spectroscopy, contact angle measurements, and optical interferometry  
were used to characterize the multilayer LB films. The films were found  
to grow in the classical Y-type mode. Optical interferometry indicated  
a bilayer thickness of 106 Å, which yields a cluster size of  $\approx 55$  Å, in  
reasonable agreement with a mean cluster size of 73 Å detd. from  
transmission electron microscopy. Incorporation of clusters into inorg.  
matrixes as outlined in the paper shows promise for the growth of  
superlattice structures, mixed cluster systems, etc., which are not  
realizable by currently used exptl. methods.

L12 ANSWER 14 OF 62 CA COPYRIGHT 2007 ACS on STN  
 AN 121:165803 CA  
 TI Chemically Modified Electrodes by Nucleophilic Substitution of  
 Chlorosilylated Platinum Oxide Surfaces  
 AU Chen, C.; Hutchison, James E.; Postlethwaite, Timothy A.; Richardson,  
 John N.; Murray, Royce W.  
 CS Kenan Laboratories of Chemistry, University of North Carolina, Chapel  
 Hill, NC, 27599-3290, USA  
 SO Langmuir (1994), 10(9), 3332-7  
 AB Chlorosilylated platinum oxide electrode surfaces can be generated by  
 reaction of SiCl<sub>4</sub> vapor with an electrochem. prep'd. monolayer of  
 platinum oxide. A variety of nucleophilic agents (such as alcs.,  
 amines, thiols, and Grignard reagents) can be used to displace chloride  
 and thereby functionalize the metal surface. Electroactive surfaces  
 prep'd. with ferrocene methanol as the nucleophile show that  
 derivatization by small mols. can achieve coverages on the order of a  
 full monolayer. Surfaces modified with long-chain alkyl groups  
 efficiently block electrode reactions of redox probes dissolved in the  
 contacting soln., but other electrochem. (double layer capacitance and  
 surface coverage) and contact angle measurements suggest that these mol.  
 films are not highly ordered, self-assembled monolayers.

L12 ANSWER 43 OF 62 CA COPYRIGHT 2007 ACS on STN  
 AN 89:65870 CA  
 TI Study of the coagulating effect of cation-active substances and their  
 effect on the electrokinetic potential of red gold hydrosol  
 AU Kudryavtseva, N. M.; Muller, V. M.; Vapaev, S. F.  
 CS Inst. Fiz. Khim., Moscow, USSR  
 SO Kolloidnyi Zhurnal (1978), 40(3), 463-9  
 LA Russian  
 AB The coagulations kinetics and electrophoretic mobility of Au sol in  
 presence of dodecyl-, hexadecyl-, and octadecylammonium chlorides were  
 studied. The exptl. results indicate a neutralization character of  
 coagulation and they are in good quant. agreement with those obtained  
 based on the DLFO theory. The coagulation of Au sol results from the  
 disappearance of the potential barrier between the colloidal particles.

L12 ANSWER 47 OF 62 CA COPYRIGHT 2007 ACS on STN  
 AN 82:175701 CA  
 TI Cohesive forces between solid particles in liquid media  
 AU Amelina, E. A.; Yusupov, R. K.; Shchukin, E. D.  
 CS Mosk. Univ., Moscow, USSR  
 SO Kolloidnyi Zhurnal (1975), 37(2), 332-5  
 LA Russian  
 AB The previously developed (A. et al., 1969) method of investigation of  
 the cohesive forces between particles in air was improved and modified  
 for measuring the cohesive forces between the particles in liq. The  
 cohesive forces (contact strength) of Ag particles were measured in H<sub>2</sub>O,  
 heptane and in surfactant (such as octadecylamine, decyl or cetyl alc.)  
 solns. in these solvents. Based on the exptl. data the ability of the  
 surfactants to form adsorption layers on Ag-particle surfaces was  
 studied. The layers act as a mech. barrier for the interparticle  
 interaction and their activity in this aspect is the stronger the

greater is the intermol. interaction between a surfactant mols. and between its mols. and the Ag surface and the weaker is the surfactant-solvent-mol. interaction.

=> log y

STN INTERNATIONAL LOGOFF AT 09:32:01 ON 31 JAN 2007

L4 130350 PROPANAMINE OR BUTANAMINE OR PENTANAMINE OR HEXANAMINE OR  
=> d his

(FILE 'HOME' ENTERED AT 12:04:14 ON 29 JAN 2007)

FILE 'REGISTRY' ENTERED AT 12:04:28 ON 29 JAN 2007

L1 130350 S PROPANAMINE OR BUTANAMINE OR PENTANAMINE OR HEXANAMINE OR  
HEPTANAMINE OR OCTANAMINE OR NONANAMINE OR DECANAMINE OR  
UNDECANAMINE DODECANAMINE OR TRIDECANAMINE OR TETRADECANAMINE OR  
PENTADECANAMINE OR HEXADECANAMINE OR HEPTADECANAMINE OR  
OCTADECANAMINE OR NONADECANAMINE

L2 78724 S L1 NOT 1(W)L1

L3 61897 S L2 NOT(COMP D OR POLYMER OR MIXT)

FILE 'CA' ENTERED AT 12:18:20 ON 29 JAN 2007

L4 125249 S L3

L5 3027221 S PARTICLE OR PARTICULATE OR COLLOID? OR NANOPART? OR NANOCRYST?  
OR NANOCLUST? OR NANOASSEMB? OR NANONETWORK? OR NANOWIRE OR  
CRYSTAL OR CLUSTER OR NANODOT OR NANOSPHER? OR(QUANTUM OR NANO)  
(W) (DOT OR WIRE OR SPHER?)

L6 1544 S L4(6A) (METAL OR GOLD OR AU OR PLATINUM OR PT OR SILVER OR AG OR  
PALLADIUM OR PD OR NICKEL OR NI)

L7 1012 S L4(6A)L5

L8 69 S L6 AND L7

L9 25 S L8 AND PY<1998

FILE 'REGISTRY' ENTERED AT 12:23:55 ON 29 JAN 2007

L10 5852 S BUTANETHIOL OR PENTANETHIOL OR HEXANETHIOL OR HEPTANETHIOL OR  
OCTANETHIOL OR NONANETHIOL OR DECANETHIOL OR UNDECANETHIOL OR  
DODECANETHIOL OR TRIDECANETHIOL OR TETRADECANETHIOL OR  
PENTADECANETHIOL OR HEXADECANETHIOL OR HEPTADECANETHIOL OR  
OCTADECANETHIOL OR NONADECANETHIOL

L11 2148 S L10 NOT 1(W)L10

L12 1879 S L11 NOT(COMP D OR POLYMER OR MIXT OR KAPPA)

FILE 'CA' ENTERED AT 12:28:51 ON 29 JAN 2007

L13 8201 S L12

L14 229 S L5(6A)L13

L15 550 S L13(6A) (METAL OR GOLD OR AU OR PLATINUM OR PT OR SILVER OR AG OR  
PALLADIUM OR PD OR NICKEL OR NI)

L16 102 S L14 AND L15

L17 10 S L16 AND PY<1998

L18 35 S L9,L17

=> d bib,ab l18 1-35

L21 ANSWER 23 OF 35 CA COPYRIGHT 2007 ACS on STN

AN 117:259163 CA

TI Method for the preparation of metal colloids in inverse micelles and  
product prepared by the method

IN Wilcoxon, Jess P.

PA United States Dept. of Energy, USA  
SO U.S., 8 pp.  
PI US 5147841 A 19920915 US 1990-617325 19901123  
PRAI US 1990-617325 19901123

AB A method is provided for prepg. catalytic elemental metal colloidal particles (e.g., Au, Pd, Ag, Rh, Ir, Ni, Fe, Pt, Mo) or colloidal alloy particles (Ag/Ir or Pt/Au). A homogeneous inverse micelle solution of a metal salt is first formed in a metal-salt solvent comprised of a surfactant (e.g., a nonionic or cationic surfactant) and an organic solvent. The size and number of inverse micelles is controlled by the proportions of the surfactant and the solvent. Then, the metal salt is reduced (by chemical reduction or by a pulsed or continuous-wave UV laser) to colloidal particles of elemental metal. After their formation, the colloidal metal particles can be stabilized by reaction with materials that permanently add surface stabilizing groups to the surface of the colloidal metal particles. The sizes of the colloidal elemental metal particles and their size distribution are determined by the size and number of the inverse micelles. A 2nd salt can be added with further reduction to form the colloidal alloy particles. After the colloidal elemental metal particles are formed, the homogeneous solution distributes to 2 phases, 1 phase rich in colloidal elemental metal particles and the other phase rich in surfactant. The colloidal elemental metal particles from 1 phase can be dried to form a powder useful as a catalyst. Surfactant can be recovered and recycled from the phase rich in surfactant.

=> log y

STN INTERNATIONAL LOGOFF AT 12:31:34 ON 29 JAN 2007

=> d his

(FILE 'HOME' ENTERED AT 11:01:59 ON 25 JAN 2007)

FILE 'REGISTRY' ENTERED AT 11:02:18 ON 25 JAN 2007

L1 306 S (MERCAPTOH? OR MERCAPTOPE? OR MERCAPTOO? OR MERCAPTON? OR  
MERCAPTOD? OR MERCAPTOU? OR MERCAPTOT?) (1A) ACID  
L2 73 S L1 NOT ((2 OR ALPHA) (W) MERCAPTO? OR ESTER OR POLYMER OR COMPD OR  
SALT OR PHOSPH?)  
L3 50 S L2 NOT (VASOPRESSIN OR ACETIC)  
L4 37 S L3 NOT (OXYTOCIN OR PIPERA? OR CYLIC)  
L5 28 S L4 NOT (PYRIDINE? OR KAPPA OR THIOPHEN? OR NAPHTH?)  
L6 24 S L5 NOT (BORON? OR MIXT OR BENZENEDI? OR THIONE)  
L7 175 S MERCAPTO AND (TETRADECANOIC OR OCTADECANOIC)  
L8 19 S L7 NOT ((2 OR ALPHA) (W) MERCAPTO? OR ESTER OR POLYMER OR COMPD OR  
SALT OR PHOSPH?)  
L9 16 S L8 NOT TETRAAZA?  
L10 40 S L6, L9  
FILE 'CA' ENTERED AT 11:32:17 ON 25 JAN 2007  
L11 3023410 S PARTICLE OR PARTICULATE OR COLLOID? OR NANOPART? OR NANOCRYST?  
OR NANOCLUST? OR NANOASSEMB? OR NANONETWORK? OR NANOWIRE OR  
CRYSTAL OR CLUSTER OR NANODOT OR NANOSPHER? OR (QUANTUM OR NANO)  
(W) (DOT OR WIRE OR SPHER?)  
L12 112051 S L11 (10A) (SELF ASSEMBL? OR ENCAPSULAT? OR MONOLAYER OR STABIL?  
OR LIGAND OR THIOL OR DITHIOL OR ALKANETHIOL OR ALKANEDITHIOL OR  
MERCAPT? OR COVALENT? OR DERIVATIZ? OR CAPPED OR CAPPING)

L13 546 S L10 AND L11  
 L14 683 S L12-13 AND SUPERLAT?  
 L15 411892 S L11(10A) (METAL OR GOLD OR AU OR PLATINUM OR PT OR SILVER OR AG  
 OR PALLADIUM OR PD OR COPPER OR CU OR NICKEL OR NI OR ALUMINUM)  
 L16 27765 S L12 AND L15  
 L17 57 S L12 AND(MERCAPTOHEXANOL OR MERCAPTOHEPTANOL OR MERCAPTOOCTANOL  
 OR MERCAPTONONANOL OR MERCAPTODECANOL OR MERCAPTOUNDECANOL OR  
 MERCAPTODODECANOL OR MERCAPTOTRIDECANOL OR MERCAPTOTETRADECANOL  
 OR MERCAPTOPENTADECANOL)  
 L18 0 S L12 AND(MERCAPTOHEXADECANOL OR MERCAPTOHEPTADECANOL OR  
 MERCAPTOOCTADECANOL OR MERCAPTONONADECANOL)  
 L19 55 S L13,L17 AND PY<1998  
 L20 125 S L14 AND PY<1998  
 L21 770 S L12 AND(LIGAND OR PLACE) (2A) EXCHANG?  
 L22 294 S L21 AND PY<1998  
 L23 103 S L15 AND L22  
 L24 2 S L22 AND FUNCTIONALI?/TI  
 L25 155 S L16 AND FLOCCULAT?  
 L26 89 S L25 AND PY<1998  
 L27 11119 S L16 AND PY<1998  
 L28 759 S L27 AND(CHEMISOR? OR ARRAY OR 3D OR 3 DIMENSION? OR THREE  
 DIMENSION?)  
 L29 287 S L28 NOT CRYSTAL  
 L30 641 S L19-20,L23-24,L26,L29  
 L31 605 S L30 NOT(PHASE TRANSITION OR ACETYLENE OR CUBANE OR SUPERALLOY  
 OR (SILICA OR SUPPORTED) (W) CATALYST OR NICKEL GRAPHITE OR  
 TWINNING OR IODIDE FLOCCUL?)  
 L32 1 S L30 NOT L31 AND ALKANETHIOLATE  
 L33 529 S L31 NOT(SUPERSIZED OR GAAS OR SILVERIODIDE OR DOPING OR  
 MAGNETIC MOMENT OR LITHOGRAPHY OR NICKEL OXIDE OR HYDRIDE OR  
 PECELET OR EMULSION OR JELLIUM OR MACROGEL?)  
 L34 2 S L31 NOT L33 AND(ELECTRICALLY COUPLED OR COULOMB BLOCKADE)  
 L35 461 S L33 NOT(OXIDE NANOCRY? OR CARBIDE OR ZETA OR AMMONIUM SILVER OR  
 REDOX OR XEROGEL OR FERRIC OR PALLADIUM II OR PYRIDINE OR  
 COFACTOR OR LONG PERIOD OR ELECTROCHEMILUM?)  
 L36 8 S L33 NOT L35 AND(COUPPLING AGENT OR ALKANETHIOLATE OR AOT OR  
 DITHIOL)  
 L37 405 S L35 NOT(MAGNESIA OR AZA OR PBS OR FACETING OR IONIZING OR IRON  
 COBALT OR HYDROGEN(2A)CHEMISOR? OR PLASMA POLYMER OR SERPENT OR  
 VITREOUS OR C60 OR SATURATED SALT OR CERAMIC OR SINKING OR PT24  
 OR ACOUSTIC OR UNDERPOTENT?)  
 L38 339 S L37 NOT(DEHYDROGEN? OR ION DEFICIENT OR WASTEWATER OR EPITAXIAL  
 OR SPIN OR ANTIBOD? OR RADIOACT? OR POLYMER MORPHOL? OR CRYSTAL  
 FIELD OR ZIEGLER OR THERMAL IMAG? OR FRACTAL OR PHOTOELECT? OR  
 THIOCTIC OR TITANIA GROW?)  
 L39 261 S L38 NOT(BONDING CAPABILIT? OR SILVER(W) (HALIDE OR CHLORIDE OR  
 BROMIDE) (4A) (COLLOID? OR SOL) OR LYOPH? OR LEED OR ZEOLITE OR AES  
 OR GOLD RECOVERY OR COLLISION OR CARBONYL OR ELECTROPHOR? OR  
 DIALYSIS OR INITIO OR SI 100 OR V CU OR PORPHYRIN OR OXIDE  
 SUPPORT)  
 L40 1 S L38 NOT L39 AND ALKANETHIOLATE  
 L41 273 S L32,L34,L36,L39-40

=> d bib,ab,kwic 1-273

L41 ANSWER 37 OF 273 CA COPYRIGHT 2007 ACS on STN  
 AN 127:113821 CA  
 TI **Self-assembly** of submicrometer rings of **particles** from solutions of **nanoparticles**  
 AU Ohara, Pamela; Heath, James R.; Gelbart, William M.  
 CS Dep. Chem. Biochem., Univ. California, Los Angeles, CA, 90095-1569, USA  
 SO Angewandte Chemie, International Edition in English (1997), 36(10), 1078-1080  
 AB The first exptl. report is given on a novel type of 2-dimensional, submonolayer **array** of organically-passivated **metal nanoparticles** and an annular theor. explanation of its formation is provided. Each **array** consists of a ring of close-packed nanoparticles and is formed on the pinning to the substrate of the perimeter of a growing hole which has nucleated in sufficiently thin films of dil. solns. of the particles.

L41 ANSWER 46 OF 273 CA COPYRIGHT 2007 ACS on STN  
 AN 126:347759 CA  
 TI A novel method of preparing **thiol-derivatized nanoparticles** of gold, platinum and silver forming superstructures  
 AU Vijaya Sarathy, K.; Kulkarni, G. U.; Rao, C. N. R.  
 CS Jawaharlal Nehru Cent. Adv. Sci. Res., Bangalore, 560 064, India  
 SO Chemical Communications (Cambridge) (1997), (6), 537-538  
 AB **Thiol-derivatized nanoparticles** of Au, Pt and Ag (diam. 1-10 nm) forming superstructures, are prepd. by the acid-facilitated transfer of well characterized **particles** in a hydrosol to a toluene layer contg. the **thiol**.

L41 ANSWER 49 OF 273 CA COPYRIGHT 2007 ACS on STN  
 AN 126:298027 CA  
 TI Synthesis of Highly Monodisperse **Silver Nanoparticles** from AOT Reverse Micelles: A Way to 2D and 3D Self-Organization  
 AU Taleb, A.; Petit, C.; Pileni, M. P.  
 CS Laboratoire SRSI URA CNRS 1662, Universite P. et M. Curie, Paris, 75005, Fr.  
 SO Chemistry of Materials (1997), 9(4), 950-959  
 AB A simple method is used to prep. highly monodispersed **silver nanoparticles** in the liq. phase, which starts from an initial synthesis in functionalized AOT reverse micelles. To narrow the particle size distribution from 43% to 12.5% in dispersion, the particles are extd. from the micellar soln. The size-selected pptn. method is used. The decrease in polydispersity of the **silver nanoparticles** is followed by transmission electron microscopy, by UV-vis spectroscopy, and by small-angle X-ray scattering. The nanocrystallites dispersed in hexane are deposited on a support. A **monolayer** made of **nanoparticles** with spontaneous hexagonal organization is obsd. The immersion of the support on the soln. yields to the formation of organized multilayers arranged as microcrystals in a face-centered cubic structure.

L41 ANSWER 54 OF 273 CA COPYRIGHT 2007 ACS on STN  
 AN 126:266941 CA  
 TI Ordered structures from **gold nanocrystals**  
 AU Eibeck, Peter; Moller, Martin

CS Ulm, Germany  
 SO Chemie in Unserer Zeit (1997), 31(1), 37-41  
 AB A brief review with 5 refs. on ordered structures from **Au nanocrystals**. Three methods are described used for the **stabilization** of small **Au clusters** by an org. matrix: 1st the connection of hexagonally oriented **Au nanocrystals** by the substitution of monofunctional **ligands** for bifunctional ones, 2nd the formation of **3D networks** of **Au nanocrystals** through base-pairing of oligonucleotides, and 3rd the mineralization of an **Au particle** in a polymer soln.

L41 ANSWER 61 OF 273 CA COPYRIGHT 2007 ACS on STN  
 AN 126:149063 CA  
 TI Self-organization of size-selected nanoparticles into **three-dimensional superlattices**  
 AU Motte, Laurence; Billoudet, Francoise; Lacaze, Emanuelle; Pileni, Marie Paule  
 CS Laboratoire S.R.S.I., Universite P. et M. Curie, Paris, F-75231, Fr.  
 SO Advanced Materials (Weinheim, Germany) (1996), 8(12), 1018-1020  
 AB The formation, using reverse micelles, and self-organization of Ag<sub>2</sub>S nanocrystallites differing in their size (3, 4, 6 nm) is reported. Examn. of the crystallites by TEM and AFM in tapping mode revealed **3-dimensional** quantum dot **superlattices** with a face-centered cubic structure. The **superlattice** was still present after several months. The size distribution could be narrowed by chem. treatment and particle extn. from the micelles.

L41 ANSWER 65 OF 273 CA COPYRIGHT 2007 ACS on STN  
 AN 126:111585 CA  
 TI **Self-assembly** of a **quantum dot superlattice** using molecularly linked metal **clusters**  
 AU Mahoney, W. J.; Bielefeld, J. D.; Osifchin, R. G.; Andres, R. P.; Henderson, J. I.; Kubiak, C. P.  
 CS School Chemical Engineering, Purdue University, West Lafayette, IN, 47907, USA  
 SO Proceedings of the Science and Technology of Atomically Engineered Materials, Richmond, Oct. 30-Nov. 4, 1995 (1996), Meeting Date 1995, 57-65. Editor(s): Jena, Puru; Khanna, Shiv N.; Rao, B. K. Publisher: World Scientific, Singapore, Singapore.  
 AB We report on a synthesis strategy for fabrication of close-packed planar arrays of nanometer-diam. metal **clusters** that are **covalently** linked by org. mol. wires. The **clusters** are gold single **crystals**, each **encapsulated** by a **monolayer** of dodecanethiol mols. A colloidal suspension of these clusters in mesitylene is spread onto a flat, insulating substrate. On evapn. of the mesitylene the **clusters self-assemble** to form a close-packed **monolayer**. This two-dimensional cluster array is crosslinked by immersing it in an acetonitrile soln. contg. conjugated di-thiol or di-isonitrile mols. which serve as mol. wires. They displace some of the dodecanethiol mols. and form well defined tunnel junctions between adjacent clusters. This crosslinked network is a two-dimensional **superlattice** of metal quantum dots. When the clusters used to synthesize the network have diams. <2 nm, it is predicted that this **superlattice** will exhibit Coulomb blockade effects at room temp.

L41 ANSWER 68 OF 273 CA COPYRIGHT 2007 ACS on STN  
 AN 126:51232 CA  
 TI Self-Organization into 2D and 3D **Superlattices** of Nanosized Particles Differing by Their Size  
 AU Motte, L.; Billoudet, F.; Lacaze, E.; Douin, J.; Pileni, M. P.  
 CS Laboratoire S.R.S.I., Universite P. et M. Curie (Paris VI), Paris, 75231, Fr.  
 SO Journal of Physical Chemistry B (1997), 101(2), 138-144  
 AB **Self-assembly** of **silver** sulfide Ag<sub>2</sub>S **nanoparticles** is reported for different **particles** sizes. **Monolayers** of **particles** organized in a hexagonal network are formed over very large domains. Small or large aggregates can also be produced. The observations indicate that the formation of **self-assemblies** of **nanoparticles** strongly depends on the prepn. conditions of the samples. In the aggregates the particles are highly organized and form pseudocrystals with a face-centered cubic structure for various particles sizes.

L41 ANSWER 71 OF 273 CA COPYRIGHT 2007 ACS on STN  
 AN 125:339726 CA  
 TI Gas-phase molecular recognition on functional monolayers immobilized on a highly sensitive quartz-**crystal** microbalance  
 AU Okahata, Yoshio; Matsuura, Kazunori; Ebara, Yasuhito  
 CS Department Biomolecular Engineering, Tokyo Institute Technology, Yokohama, 226, Japan  
 SO Supramolecular Science (1996), 3(1-3), 165-169  
 AB Self-assembled monolayers of alkanethiols having functional groups (HS(CH<sub>2</sub>)<sub>10</sub>X, X = H, COOH, CONH<sub>2</sub>, NH<sub>2</sub>, thymine and adenine bases) were immobilized on the Au electrode of a quartz-**crystal** microbalance (QCM), and the binding kinetics of guest mols. from the gas phase were studied by monitoring the time evolution of frequency decreases (mass increases) of the QCM. A highly sensitive, 63-MHz overtone frequency of a conventional 9-MHz at AT-cut QCM was developed to detect monolayer adsorption of small mols. When HOAc was used as guest mols., it adsorbed on the -CONH<sub>2</sub> membrane as a Langmuir-type monolayer and adsorbed as multilayers on the -COOH and -NH<sub>2</sub> membranes, but scarcely adsorbed on the simple alkane membrane (-H membrane). When self-assembled monolayers bearing a thymine or adenine base as a terminal group are used, selective binding processes of complementary guest mols. are obsd.; 2-aminopyridine (an adenine model) and  $\gamma$ -butyrolactam (a thymine model) selectively bind to the thymine and adenine monolayers, resp.

L41 ANSWER 73 OF 273 CA COPYRIGHT 2007 ACS on STN  
 AN 125:313588 CA  
 TI Collective computational activity in **self-assembled arrays** of **quantum dots**: A novel neuromorphic architecture for nanoelectronics  
 AU Roychowdhury, Vwani P.; Janes, David B.; Bandyopadhyay, Supriyo; Wang, Xiaodong  
 CS School Electrical and Computer Engineering, Purdue University, West Lafayette, IN, 47907, USA  
 SO IEEE Transactions on Electron Devices (1996), 43(10), 1688-1699  
 AB We describe a new class of nanoelectronic circuits which exploits the



charging behavior in resistively/capacitively linked **arrays** of nanometer-sized metallic islands (**quantum dots**), **self-assembled** on a resonant tunneling diode, to perform neuromorphic computation. These circuits produce associative memory effects and realize the additive short-term memory (STM) or content addressable memory (CAM) models of neural networks without requiring either large-area/high-power operational amplifiers, or massive interconnectivity between devices. Both these requirements had seriously hindered the application of neural networks in the past. Addnl., the circuits can solve NP-complete optimization problems (such as the traveling salesman problem) using single electron charge dynamics, exhibit rudimentary image-processing capability, and operate at room temp. unlike most quantum devices. Two-dimensional (2D) processors, with a 100 x 100 pixel capacity, can be fabricated in an area of 10<sup>-8</sup> cm<sup>2</sup> leading to unprecedented functional d. Possible routes to synthesizing these circuits, employing self-assembly, are also discussed.

L41 ANSWER 74 OF 273 CA COPYRIGHT 2007 ACS on STN

AN 125:291641 CA

TI **Self-assembly** of a two-dimensional **superlattice** of molecularly linked **metal clusters**

AU Andres, Ronald P.; Bielefeld, Jeffery D.; Henderson, Jason I.; Janes, David B.; Kolagunta, Venkat R.; Kubiak, Clifford P.; Mahoney, William J.; Osifchin, Richard G.

CS School Chemical Engineering, Purdue Univ., West Lafayette, IN, 47907, USA

SO Science (Washington, D. C.) (1996), 273(5282), 1690-1693

AB Close-packed planar **arrays** of nanometer-diam. **gold clusters** that are **covalently** linked to each other by rigid, double-ended org. mols. were self-assembled. **Au nanocrystals**, each **encapsulated** by a **monolayer** of alkyl **thiol** mols., were cast from a **colloidal** soln. onto a flat substrate to form a close-packed **cluster monolayer**. Org. interconnects (aryl dithiols or aryl diisonitriles) displaced the alkyl **thiol** mols. and **covalently** linked adjacent **clusters** in the **monolayer** to form a two-dimensional **superlattice** of **metal quantum dots** coupled by uniform tunnel junctions. Elec. conductance through such a **superlattice** of 3.7-nm-diam. **Au clusters**, deposited on a SiO<sub>2</sub> substrate in the gap between two **Au** contacts and linked by an aryl di-isonitrile [1,4-di(4-isocyanophenylethynyl)-2-ethylbenzene], exhibited nonlinear Coulomb charging behavior.

L41 ANSWER 81 OF 273 CA COPYRIGHT 2007 ACS on STN

AN 125:178469 CA

TI Nanocrystal gold molecules

AU Whetten, Robert L.; Khoury, Joseph T.; Alvarez, Marcos M.; Murthy, Srihari; Vezmar, Igor; Wang, Z. L.; Stephens, Peter W.; Cleveland, Charles L.; Luedtke, W. D.; Landman, Uzi

CS Sch. Phys. Chem., Georgia Inst. Technol., Atlanta, GA, 30332, USA

SO Advanced Materials (Weinheim, Germany) (1996), 8(5), 428-33

AB **Au nanocrystals** passivated by **self-assembled monolayers** of straight-chain alkylthiolate mols. were obtained as highly purified mol. materials of high intrinsic stability. Evidence is presented for a predicted discrete sequence of energetically optimal fcc. structures of

a truncated octahedral morphol. motif. The nanocrystal materials have a propensity to form extended **superlattices**.

L41 ANSWER 85 OF 273 CA COPYRIGHT 2007 ACS on STN

AN 125:152018 CA

TI Molecular **Self-Assembly** of Aliphatic **Thiols** on **Gold Colloids**

AU Weisbecker, Carl S.; Merritt, Margaret V.; Whitesides, George M.

CS Chemistry Department, Harvard University, Cambridge, MA, 02138, USA

SO Langmuir (1996), 12(16), 3763-3772

AB **Self-assembled monolayers** (SAMs) were formed on **Au colloids** in 50% aq. EtOH in the presence of **alkanethiols** (HS(CH<sub>2</sub>)<sub>n</sub>R, where R represents a series of neutral and acidic functional groups). **Chemisorption** of **alkanethiols** on the **Au colloids** significantly changes the rates of **flocculation** of the **Au** dispersions; the magnitudes of these pH-dependent changes are a function of chain length (n) and the terminal functionality (R) in a manner consistent with formation of SAMs on the **colloid** surface. The reduced rate of dissoln. of **alkanethiol**-treated **colloids** by wet chem. etchants, TEM, and XPS data further support the formation of SAMs.

IT 107-96-0, 3-**Mercaptopropionic** acid 112-55-0, 1-Dodecanethiol 34451-26-8, 2-(Perfluorohexyl)ethanethiol 69839-68-5, 16-**Mercaptohexadecanoic** acid 71310-21-9, 11-**Mercaptoundecanoic** acid 73391-27-2, Methyl 11-**mercaptoundecanoate** 74328-61-3, 8-**Mercaptooctanoic** acid 82001-53-4, 12-**Mercaptododecanoic** acid 115646-13-4, 10-**Mercapto**-1-decanol 130727-44-5 156125-36-9, 11-**Mercaptoundecanoyl**-1-phosphonic acid 157222-22-5, 11-**Mercaptoundecanoyl**-1-boronic acid (**alkanethiol self-assembled monolayers** on **Au colloids** in aq. EtOH and effects on **flocculation** rates)

L41 ANSWER 86 OF 273 CA COPYRIGHT 2007 ACS on STN

AN 125:151912 CA

TI Highly Oriented Molecular **Ag Nanocrystal Arrays**

AU Harfenist, Steven A.; Wang, Z. L.; Alvarez, Marcos M.; Vezmar, Igor; Whetten, Robert L.

CS School of Physics, Georgia Institute of Technology, Atlanta, GA, 30332-0430, USA

SO Journal of Physical Chemistry (1996), 100(33), 13904-13910

AB Orientational ordering of faceted nanocrystals in nanocrystal **arrays** was obsd. directly for the 1st time (using TEM imaging and diffraction to resolve the structure of thin mol.-cryst. films of **Ag nanocrystals** passivated by alkylthiolate **self-assembled monolayers**). The type of ordering is detd. by the nanocrystal faceted morphol., as mediated by the interactions of surfactant groups tethered to the facets on neighboring nanocrystals. Orientational ordering is crucial for the understanding of the fundamental properties of quantum-dot **arrays**, as well as for their optimal utilization in optical and electronic applications.

L41 ANSWER 87 OF 273 CA COPYRIGHT 2007 ACS on STN

AN 125:151911 CA

TI Structure, Dynamics, and Thermodynamics of Passivated **Gold Nanocrystallites** and Their Assemblies

AU Luedtke, W. D.; Landman, Uzi  
CS School of Physics, Georgia Institute of Technology, Atlanta, GA, 30332, USA  
SO Journal of Physical Chemistry (1996), 100(32), 13323-13329  
AB The structure, dynamics, and thermodyn. of **Au nanocrystallites** passivated by alkylthiolate **monolayers** were studied by mol. dynamics simulations in different environments (e.g., as isolated gas-phase clusters, adsorbed on a graphite surface, assembled into **3-dimensional superlattices**). The packing arrangements and densities of the **monolayers** passivating the facets of the core **Au nanocrystallites** differ from those found on extended **Au** surfaces, exhibiting organization into mol. bundles of preferred orientations which upon heating undergo a reversible melting transition from the ordered bundled state to a uniform intermol. orientational distribution. The equil. geometries of adsorbed nanocrystallites depend on the chain length of the passivating mols. which effectively lubricate the interface between the Au core and the graphite surface conferring high surface mobility to the crystallites, involving a collective slip-diffusion mechanism. The room-temp. equil. structure of the **superlattice** made of Au<sub>140</sub>(C<sub>12</sub>H<sub>25</sub>S)<sub>62</sub> nanocrystallites is predicted to be tetragonally distorted fcc with enhanced orientational bundling of the passivating mols. along the direction of the tetragonal distortion. The cohesion of the **superlattice** derives predominantly from the interactions between the interlocking mol. bundles. Passivation by shorter chain mols. (Au<sub>140</sub>(C<sub>4</sub>H<sub>9</sub>S)<sub>62</sub>) results in a room-temp. bcc **superlattice** structure (transforming to a fcc lattice at higher temps.).

L41 ANSWER 88 OF 273 CA COPYRIGHT 2007 ACS on STN

AN 125:124691 CA

TI Infrared Spectroscopy of **Three-Dimensional Self-Assembled Monolayers: N-Alkanethiolate Monolayers on Gold Cluster Compounds**

AU Hostetler, Michael J.; Stokes, Jennifer J.; Murray, Royce W.

CS Kenan Laboratories of Chemistry, University of North Carolina, Chapel Hill, NC, 27599-3290, USA

SO Langmuir (1996), 12(15), 3604-3612

AB Transmission IR spectroscopy was used to probe the structure of alkanethiolate **monolayers** adsorbed onto nanometer-sized **gold clusters**. The alkyl chain lengths vary between propanethiolate and tetracosanethiolate; specifically the C<sub>3</sub>, C<sub>4</sub>, C<sub>5</sub>, C<sub>6</sub>, C<sub>7</sub>, C<sub>8</sub>, C<sub>10</sub>, C<sub>12</sub>, C<sub>16</sub>, C<sub>20</sub>, and C<sub>24</sub> alkanethiolates were examined as solid suspensions in KBr pellets. It was found that the smaller chain lengths (C<sub>3</sub>, C<sub>4</sub>, and C<sub>5</sub>) are relatively disordered, with large amounts of gauche defects present, and thus most resemble the free alkanes in the liq. state. The longer length alkanethiolates are predominantly in the all trans zigzag conformation. There are detectable amounts of near surface gauche defects, the amount of which decreases with increasing chain length, and a reasonably high percentage of end-gauche defects, the relative amount of which increases with increasing chain length. Internal gauche defects cannot be detected. A model is proposed to explain these observations, and the data are compared with that collected for alkanethiolates self-assembled onto the more traditional two-dimensional systems.

L41 ANSWER 97 OF 273 CA COPYRIGHT 2007 ACS on STN

AN 125:45967 CA  
 TI Two-dimensional **arrays** of **electrically coupled** nanometer diameter metallic clusters  
 AU Kolagunta, V. R.; Janes, D. B.; Bielefeld, J. D.; Andres, R. P.; Osifchin, R. G.; Henderson, J. I.; Kubiak, C. P.  
 CS School of Electrical and Computer Engineering, Purdue University, West Lafayette, IN, 47907, USA  
 SO Proceedings - Electrochemical Society (1996), 95-17(Quantum Confinement), 56-69  
 AB The authors report on the synthesis and characterization of close-packed **arrays** of nanometer-diam. **metal clusters elec. coupled** using rigid, double-ended org. mols. These **cluster arrays** are **self-assembled** on a flat surface from a **colloidal** suspension contg. the **metal clusters encapsulated** by a **monolayer** of dodecanethiol mols. The **array** is then exposed to the linking mol. wire dissolved in soln. wherein the dodecanethiol mols. on the surface of the clusters are displaced by the linking mol. The formation of these **arrays** between two metal contact pads that are sepd. by  $\square 500$  nm is demonstrated. Elec. characterization at various stages of **array** formation is presented along with a discussion of the possible conduction mechanisms.

L41 ANSWER 98 OF 273 CA COPYRIGHT 2007 ACS on STN  
 AN 125:42434 CA  
 TI Guest selective adsorption from the gas phase onto a functional self-assembled monolayer immobilized on a super-sensitive quartz-**crystal** microbalance  
 AU Matsuura, Kazunori; Ebara, Yasuhito; Okahata, Yoshio  
 CS Department of Biomolecular Engineering, Tokyo Institute of Technology, Nagatsuda, Midori-ku, Yokohama, 226, Japan  
 SO Thin Solid Films (1996), 273(1-2), 61-5  
 AB A self-assembled monolayer of alkanethiols having functional groups (HS-(CH<sub>2</sub>)<sub>10</sub>-X; X = -H, -COOH, -CONH<sub>2</sub>) was immobilized on Au electrodes of a quartz-**crystal** microbalance (QCM), and the adsorption behavior of gaseous org. mols. (e.g., aliph. acids, amines, alcs., alkanes) was obsd. from frequency decreases (mass increases) of the QCM plate in gas-phase. The authors used a super-sensitive, 7th overtone frequency of a 9 MHz AT-cut QCM (63 MHz) to detect a monolayer adsorption of small org. mols. Assocn. const. (K<sub>a</sub>), adsorption (k<sub>1</sub>) and desorption rate consts. (k<sub>-1</sub>) can be obtained from curve fitting of time courses of frequency changes (mass changes). All of these org. mols. scarcely adsorbed on the alkane (X = -H) membrane. The -CONH<sub>2</sub> membrane, selectively adsorbed only HOAc, but not caproic and nonanoic acids, which shows that H bond interactions are important, but hydrophobic interactions are not. The -COOH membrane adsorbed both HOAc and ethylenediamine (but not monoamines) in large amts. in contrast to the -H membrane behavior. The adsorption of ethylenediamine can be explained by acid-base interactions.

L41 ANSWER 100 OF 273 CA COPYRIGHT 2007 ACS on STN  
 AN 124:329180 CA  
 TI Synthesis of a quantum dot **superlattice** using molecularly linked metal clusters  
 AU Osifchin, R. G.; Mahoney, W. J.; Bielefeld, J. D.; Andres, R. P.;

Henderson, J. I.; Kubiak, C. P.

- CS School of Chemical Engineering, Purdue University, West Lafayette, IN, 47907, USA
- SO Superlattices and Microstructures (1995), 18(4), 283-9
- AB We report on a synthesis strategy for fabrication of close-packed planar arrays of nanometer-diam. metal **clusters** that are **covalently** linked by org. mol. wires. The **clusters** are gold single **crystals**, each **encapsulated** by a **monolayer** of dodecanethiol mols. A colloidal suspension of these clusters in mesitylene is spread onto a substrate. On evapn. of the solvent the **clusters self-assemble** to form a close-packed **monolayer**. This cluster network is then crosslinked by immersing the substrate in an acetonitrile soln. contg. a conjugated di-isonitrile mol. (1,4-di(4-isocyanophenylethynyl)2-ethylbenzene). Transmission electron micrographs of the cluster arrays before and after immersion indicate that the diisonitrile mols. partially substitute for the dodecanethiol mols. to produce a crosslinked network of clusters joined by the di-isonitrile. The interesting feature of this network is that it represents a 2D **superlattice** of metal quantum dots coupled by well defined tunnel junctions. When the gold clusters used to synthesize the network have diams. less than approx. 2 nm, it is predicted that this **superlattice** will exhibit Coulomb blockade effects at room temp.

L41 ANSWER 101 OF 273 CA COPYRIGHT 2007 ACS on STN

AN 124:329179 CA

TI Electronic conduction through 2D **arrays** of nanometer diameter **metal clusters**

AU Janes, D. B.; Kolagunta, V. R.; Osifchin, R. G.; Bielefeld, J. D.; Andres, R. P.; Henderson, J. I.; Kubiak, C. P.

CS School of Electrical and Computer Engineering, Purdue University, West Lafayette, IN, 47907, USA

SO Superlattices and Microstructures (1995), 18(4), 275-82

AB An exptl. study of elec. conduction through **arrays** of nanometer-diam. metallic clusters linked by org. mols. is presented. **Gold clusters**, having diams. of  $\square 4$  nm and **encapsulated** by a **monolayer** of dodecanethiol, are deposited from soln. on to specially prepd. substrates to form a close-packed **cluster monolayer**. Nearest-neighbors in this 2D **array** of **encapsulated clusters** are then **covalently** linked using a conjugated org. mol. approx. 2.2 nm in length having isocyanide groups at both ends. In order to allow both elec. characterization and TEM imaging, the **cluster arrays** are deposited in 500 nm wide gaps between **gold** contacts on a free standing, insulating SiO<sub>2</sub> film. Electronic conduction through linked 2D **arrays** approx. 80 clusters in length has been obsd. at room temp. The structure of the **arrays** and current-voltage relationships for the linked **arrays** are presented.

L41 ANSWER 103 OF 273 CA COPYRIGHT 2007 ACS on STN

AN 124:300856 CA

TI Monolayers in **three dimensions**: synthesis and electrochemistry of  $\omega$ -**functionalized alkanethiolate-stabilized gold cluster** compounds

AU Hostetler, Michael J.; Green, Stephen J.; Stokes, Jennifer J.; Murray, Royce W.

CS Kenan Laboratories of Chemistry, University of North Carolina, Chapel

Hill, NC, 27599-3290, USA

SO Journal of the American Chemical Society (1996), 118(17), 4212-13  
AB The synthesis and characterization of **Au cluster** compds. contg. a mixt. of **alkanethiolate** and  $\omega$ -substituted **alkanethiolate ligands** are reported. **Cluster** mols. prepd. with **alkanethiolate ligands**, according to previous work, have a  $\approx 1.2$  nm radius Au core that, modeled as a 309-Au atom cubooctahedron, bears a monolayer ligand skin of  $\approx 95$  alkenethiolate chains. The  $\omega$ -functionalized clusters are synthesized by **place exchange** reactions in soln. mixts. of **alkanethiolate cluster** mols. and  $\omega$ -substituted **alkanethiols**, where the  $\omega$ -substituent can be -Br, -CN, vinyl, or ferrocenyl. The reaction products, according to  $^1\text{H}$  NMR spectroscopy, include cluster mols. with as many as 44 bromide and 15 ferrocenyl  $\omega$ -substituents. Steric  $\omega$ -substituent interactions appear to constrain the extent of **place exchange**. Ferrocenyl-substituted **clusters** are electroactive in  $\text{CH}_2\text{Cl}_2$  solns. as adsorbed **monolayers** and as diffusing solutes. The mass transport behavior indicates that as many as 15 ferrocene units in a substituted cluster mol. can be oxidized at an electrode surface over a potential range as narrow as that required to oxidize a ferrocene monomer, i.e., the cluster has promise as a reagent that delivers multiple equiv. of redox activity at nearly identical formal potentials. The **Au** cores of the **clusters** also exhibit "double layer" charging behavior and are thus true mol. "nanoelectrodes".

L41 ANSWER 114 OF 273 CA COPYRIGHT 2007 ACS on STN

AN 124:38546 CA

TI Monolayers in **Three Dimensions**: NMR, SAXS, Thermal, and Electron Hopping Studies of **Alkanethiol Stabilized Gold Clusters**

AU Terrill, Roger H.; Postlethwaite, Timothy A.; Chen, Chun-hsien; Poon, Chi-Duen; Terzis, Andreas; Chen, Aidi; Hutchison, James E.; Clark, Michael R.; Wignall, George; et al.

CS Kenan Laboratories of Chemistry, University of North Carolina, Chapel Hill, NC, 27599-3290, USA

SO Journal of the American Chemical Society (1995), 117(50), 12537-48

AB **Au clusters stabilized by chemisorbed monolayers** of octane-, dodecane-, or hexadecanethiolate were studied in soln. and in the solid phase. These materials can be pumped free of solvent to form a dark brown solid that can be re-dissolved in nonpolar solvents. Their exceptional **stability** suggests that they may be viewed as **cluster** compds. The **self-assembled alkanethiolate monolayers stabilizing the metal clusters** can be studied by using techniques that are insufficiently sensitive for study of a monolayer on a flat surface (e.g.,  $^1\text{H}$  and  $^{13}\text{C}$  NMR, elemental anal., DSC, thermogravimetry (TGA), diffusion-ordered NMR spectroscopy (DOSY)). Results from such measurements (combined with SAXS data on solns. of the clusters and AFM and STM images) are consistent with a small, monodisperse ( $12 \text{ \AA}$  radius) Au core, which modeled as a sphere contains  $\approx 400$  Au atoms and  $\approx 126$  alkanethiolate chains, or if modeled as a cubooctahedral structure contains 309 Au atoms and  $\approx 95$  alkanethiolate chains. High-resoln. NMR spectra of **cluster** solns. display well-defined resonances except for methylenes nearest the **Au** interface; the absence of the latter resonances is attributed to a combination of broadening mechanisms based on the discontinuous change in magnetic susceptibility at the metal-hydrocarbon interface and

residual dipolar interactions. Films of the dry, solid cluster compd. on interdigitated **array** electrodes exhibit current-potential responses characteristic of electron hopping cond. in which electrons tunnel from Au core to Au core. The electron hopping rate decreases and the activation barrier increases systematically at longer alkane chain length. The results are consistent with electron transport rate control being a combination of thermally activated electron transfer to create oppositely charged Au cores (cermet theory) and distance-dependent tunneling ( $\beta = 1.2 \text{ \AA}^{-1}$ ) through the oriented alkanethiolate layers sepg. them.

L41 ANSWER 121 OF 273 CA COPYRIGHT 2007 ACS on STN

AN 123:94218 CA

TI Organization of **Au Colloids** as **Monolayer** Films onto ITO Glass Surfaces: Application of the **Metal Colloid** Films as Base Interfaces To Construct Redox-Active **Monolayers**

AU Doron, Amihod; Katz, Eugenii; Willner, Itamar

CS Institute of Chemistry, Hebrew University of Jerusalem, Jerusalem, 91904, Israel

SO Langmuir (1995), 11(4), 1313-17

AB **Gold colloid** films are organized on In Sn oxide (ITO) surfaces by using (aminopropyl)siloxane or (mercaptopropyl)siloxane as base **monolayer** for the deposition of the **metal colloid**. Different **Au colloids** (ranging in **particles** of diams. 25, 30, 35, and 120 nm) were deposited on the monolayer-modified ITO surfaces. For the small **particles** (25 nm), an almost continuous **Au colloid** film is formed with interparticle spacing of 10-25 nm. The surface coverage of the **Au colloid** on the (aminopropyl)siloxane **monolayer** is higher than that for the (mercaptopropyl)siloxane-modified ITO. The **Au colloid** films provide active surfaces for the **self-assembly** of redox-active thiolate monolayers. 8-(N-Methyl-4,4'-bipyridinyl)octanoic acid was **covalently** linked to a cystamine **monolayer** assembled on the **Au colloids**. For the 25 nm **Au colloid**, the surface coverage by the redox active unit ( $6.8 \times 10^{-10} \text{ mol cm}^{-2}$ ) is  $\square$  12-fold higher than that of the (aminopropyl)siloxane monolayer-modified ITO (lacking the Au film). The surface coverages of the **Au colloid** films by the bipyridinium **monolayers** increase as the **colloid particle** sizes decrease.

L41 ANSWER 123 OF 273 CA COPYRIGHT 2007 ACS on STN

AN 123:18732 CA

TI **Self-assembled metal colloid monolayers**: an approach to SERS substrates

AU Freeman, R. Griffith; Grabar, Katherine C.; Allison, Keith J.; Bright, Robin M.; Davis, Jennifer A.; Guthrie, Andrea P.; Hommer, Michael B.; Jackson, Michael A.; Smith, Patrick C.; et al.

CS Division Science, Northeast Missouri State University, Kirksville, MO, 63501, USA

SO Science (Washington, D. C.) (1995), 267(5204), 1629-31

AB The **self-assembly** of monodisperse **Au** and **Ag colloid particles** into **monolayers** on polymer-coated substrates yields macroscopic surfaces that are highly active for surface-enhanced Raman scattering (SERS). Particles are bound to the substrate through multiple bonds between the **colloidal metal** and functional groups on the polymer (e.g., cyanide

(CN), amine (NH<sub>2</sub>), thiol (SH)). Surface evolution (which can be followed in real time by UV-visible spectroscopy and SERS) can be controlled to yield high reproducibility on both the nanometer and the centimeter scales. On conducting substrates, **colloid monolayers** are electrochem. addressable and behave like a collection of closely spaced microelectrodes. These favorable properties and the ease of **monolayer** construction suggest a widespread use for **metal colloid**-based substrates.

L41 ANSWER 125 OF 273 CA COPYRIGHT 2007 ACS on STN

AN 123:18449 CA

TI **Ligand-stabilized giant metal clusters and colloids**

AU Schmid, G.

CS Institut Anorganische Chemie, University of Essen, Germany

SO Physics and Chemistry of Materials with Low-Dimensional Structures (1994), 18(Physics and Chemistry of Metal Cluster Compounds), 107-34

AB A review on soln. chem. methods for prepg. well-defined **ligand-stabilized** transition **metal colloids** which can be regarded as huge **clusters**. The chem. properties of these colloids are described and their potential catalytic applications are discussed. STM and high resolu. TEM images of typical colloids are presented. 55 Refs.

L41 ANSWER 162 OF 273 CA COPYRIGHT 2007 ACS on STN

AN 118:15338 CA

TI Preparation of organosol of noble **metal clusters** with novel method

AU Toshima, Naoki; Liu, Hanfan

CS Fac. Eng., Univ. Tokyo, Tokyo, 113, Japan

SO Chemistry Letters (1992), (10), 1925-8

AB The organosols of noble **metal clusters** such as monometallic Pt, Pd, and Rh **clusters**, and bimetallic Au/Pd, Pd/Pt, and Pt/Rh **clusters** in org. media like BuOH were prepd. by reversible transfer of the cluster particles from an aq. phase to the org. phase by using a coordination capture technique with PPh<sub>3</sub>. The electronic spectra and transmission electron micrographs of the dispersed clusters before and after the transfer indicate that no change occurs in size and size distribution during the transfer.

L41 ANSWER 202 OF 273 CA COPYRIGHT 2007 ACS on STN

AN 108:119664 CA

TI Thin metallic films from solvated metal atoms

AU Cardenas-Trivino, Galo; Klabunde, Kenneth J.; Dale, Brock

CS Dep. Chem. Phys., Kansas State Univ., Manhattan, KS, 66506, USA

SO Proceedings of SPIE-The International Society for Optical Engineering (1988), 821(Model. Opt. Thin Films), 206-13

AB Metals were evapd. under vacuum and the metal atoms solvated by excess org. solvents at low temp. Upon warming stable **colloidal metal particles** were formed by controlled **metal** atom clustering. The **particles** were **stabilized** toward **flocculation** by solvation and electrostatic effects. Upon solvent removal the colloidal particles grew to form thin films that were metallic in appearance, but showed higher resistivities than pure metallic films. Au, Pd, Pt, and esp. In are discussed.



L41 ANSWER 204 OF 273 CA COPYRIGHT 2007 ACS on STN  
AN 107:205807 CA  
TI Living **colloidal palladium** in nonaqueous solvents. Formation, **stability**, and film-forming properties. Clustering of metal atoms in organic media. 14  
AU Cardenas-Trivino, Galo; Klabunde, Kenneth J.; Dale, E. Brock  
CS Dep. Chem., Kansas State Univ., Manhattan, KS, 66506, USA  
SO Langmuir (1987), 3(6), 986-92  
AB Pd atoms in cold Me<sub>2</sub>CO, EtOH, and other org. solvents **cluster** to form living colloidal particles. The **Pd colloids** are stable for months at room temp. in Me<sub>2</sub>CO, and their **particle** sizes (□8 nm) vary slightly according to the solvent:Pd ratio and warming procedures. The **particles** are **stabilized** by both steric **stabilization** (solvation) and by incorporation of neg. charge. They are "living" in the sense that prodn. of larger particles and films can be accomplished simply by solvent removal. The Pd films formed at room temp. by solvent evapn. have semiconductor properties (rather than metal-like cond.) due to the incorporation of substantial portions of org. solvent (and small amts. of solvent fragments). Upon heat treatment the films become smoother, give up org. solvent, and decrease in resistivity. These are the 1st examples of nonaq. **Pd colloids** and the first examples of film formation from such **colloidal** solns.

L41 ANSWER 225 OF 273 CA COPYRIGHT 2007 ACS on STN  
AN 98:114329 CA  
TI Deposition of **colloidal particles** in **monolayers** and multilayers  
AU Gaines, George L., Jr.  
CS Gen. Electr. Corp. Res. Dev., Schenectady, NY, 12301, USA  
SO Thin Solid Films (1983), 99(1-3), 243-8  
AB Preliminary observations are reported on the deposition of Al<sub>2</sub>O<sub>3</sub>, SiO<sub>2</sub>, ZnS, and **Au colloidal particles** on solid surfaces. Al<sub>2</sub>O<sub>3</sub>, which is pos. charged, can induced subsequent deposition of the other colloids (which are neg.) onto glass, as pointed out by Iler (1966). However, more uniform, reproducible and rapid deposition occurs on 2 monolayers of docosylamine sulfate applied to the glass by the Langmuir-Blodgett technique. The ZnS sol, which is not stable to **flocculation**, deposits as **3 dimensional** aggregates. The deposition of **colloidal Au** was followed by optical absorption measurements, and layers contg. a substantial fraction of the close-packed limit were obtained.

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FILE 'REGISTRY' ENTERED AT 08:48:17 ON 24 JAN 2007

L1 1899 S 1 3 PROPANEDITHIOL OR 1 4 BUTANEDITHIOL OR 1 5 PENTANEDITHIOL OR 1 6 HEXANEDITHIOL OR 1 7 HEPTANEDITHIOL OR 1 8 OCTANEDITHIOL OR 1 9 NONANEDITHIOL OR 1 10 DECANEDITHIOL OR 1 12 DODECANEDITHIOL OR 1 16 HEXADECANEDITHIOL OR 1 18 OCTADECANEDITHIOL  
L2 1295 S L1 NOT (KAPPA OR MU OR ETA)  
L3 437 S L2 NOT(ESTER OR POLYMER OR COMPD)

L4 390 S L3 NOT (T 4 OR OC 6)  
L5 364 S L4 NOT(SP 4 OR STERIO? OR BORATO? OR DICARBAU?)  
L6 286 S L5 NOT(SALT OR SP 5 OR DIACETATE OR HYDROCHLOR? OR ETHANEDIOATE)  
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L7 8617 S L6  
L8 5196 S L7 AND PY<1998  
L9 60 S L8 AND(AU OR GOLD)

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L9 ANSWER 7 OF 60 CA COPYRIGHT 2007 ACS on STN  
AN 127:158651 CA  
TI Surface plasmon resonance studies of the adhesion of human IgG and BSA to **gold** surfaces modified by self-assembled monolayers (SAM)  
AU Silin, V.; Weetall, H.  
CS USA  
SO Proceedings of the Annual Meeting of the Adhesion Society (1996), 19th, 211-214  
AB We examd. SAM kinetic formation on **Au** surfaces and the adsorption kinetics of the proteins bovine serum albumin and human IgG on these surfaces, in real time, by using surface plasmon resonance. The following alkyl thiols for the prepn. of SAM layers were used: 16-mercaptohexadecanethiol, 16-mercaptohexadecanoic acid, 16-mercaptohexadecanol, phenolic alkanethiol, 2-aminoethanethiol, and oligoethylene oxide. The protein adsorption properties on the different SAMs are discussed.

L9 ANSWER 9 OF 60 CA COPYRIGHT 2007 ACS on STN  
AN 127:128632 CA  
TI Light-directed assembly of nanoparticles  
AU Vossmeier, Tobias; DeIonno, Erica; Heath, James R.  
CS Mol. Design. Inst., Lawrence Berkeley Lab. Dep. Chem. Biochem., Univ. California, Los Angeles, CA, 90095-1569, USA  
SO Angewandte Chemie, International Edition in English (1997), 36(10), 1080-1083  
AB Cleaned glass or silicon slides were treated with 3-aminopropyltrimethylethoxysilane and the surface amino groups were reacted with nitroveratryloxycarbonylglycine (NVOC) to produce photosensitive surface. Imagewise irradiation with  $\lambda > 340$  nm through a microchip mask yielded a pattern of free- and protected amino groups. The patterned substrate was kept overnight in the soln. containing 12-aminododecane-capped **Au** particles to bind **Au** nanocrystals to the surface-bound amino-groups. To amplify particle binding the surface-bound **Au** particles were treated with 1,8-octanedithiol to yield free, surface-bound thiol groups on the areas where **Au** particles were attached to the surface. Following the dithiol treatment the slides were dipped again in the **gold** soln. to bind more **Au** nanocrystals on the previously bound particles. This dithiol amplification was repeated several times to enhance the micropattern contrast until it was readily visible with the naked eye or via optical microscope.

L9 ANSWER 17 OF 60 CA COPYRIGHT 2007 ACS on STN  
AN 126:80405 CA

TI Scanning Tunneling Microscopy Observations of  $\alpha,\omega$ -Bis  
(mercaptomethylthienyl)alkane Derivatives Self-Assembled on **Au**(111)  
AU Nakamura, Tohru; Kondoh, Hiroshi; Matsumoto, Mutsuyoshi; Nozoye,  
Hisakazu  
CS Department of Molecular Engineering, National Institute of Materials and  
Chemical Research, Tsukuba, 305, Japan  
SO Langmuir (1996), 12(25), 5977-5979  
AB 1,8-Bis(5-mercaptomethyl-2-thienyl)octane (1a), 1,8-bis(5'-  
mercaptomethyl-2,2'-bithienyl-5-yl)octane (1b), 1-(5-mercaptomethyl-2-  
thienyl)-4-(2-thienyl)butane (1c), 1,8-bis(2,2'-bithienyl-5-yl)octane  
(2), 1,12-dodecanedithiol (3), and 1,4-bis(mercaptomethyl)benzene (4)  
were prepd., and their adsorption states on a **Au** single crystal surface  
were studied by using STM under ultrahigh-vacuum conditions. Two  
ordered phases were obsd. for the mercaptomethylthiophene derivs. 1.  
The 1st phase is composed of 1-dimensional mol. rows with spacings  
smaller than those for other monothiols and the 2nd one has a previously  
unknown 2-dimensional honeycomb structure. In both phases, the mols.  
are arranged with end-on configuration in which only 1 end thiol is  
attached to the **Au** substrate. The absence of the honeycomb structure  
for 3 and 4 suggests the important role of the mercaptomethylthienyl  
moiety for the formation of the specific structures.

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TI Coated **gold** sols for ligand binding

IN Shigekawa, Brian Layne; Hsieh, Yung Ao

PA AKZO N. V., Neth.

SO Eur. Pat. Appl., 19 pp.

PI EP 489465 A2 19920610 EP 1991-203125 19911201

US 5294369 A 19940315 US 1990-622462 19901205

PRAI US 1990-622462 A 19901205

AB **Au** sols are disclosed which are coated with alkanethiols and alkanethiol  
derivs., which provide groups on the sol for linking of binding moieties  
(antibodies, antigens, etc.). Di- and trithio compds. bound to **Au** sol  
also facilitate the adsorption of antibodies, antigens, etc. to the sol.  
The coating process, as well as test kits incorporating the coated sols,  
are also included. An **Au** sol was coated with 1-dodecanethiol and 12-  
mercapto-1-dodecanoic acid, and bovine serum albumin (BSA) was  
conjugated to the coated sol. The BSA-conjugated coated **Au** sol was  
tested in a sol particle immunoassay. Also described is e.g. the  
improvement of coating properties of antibody on trithiocyanuric acid-  
coated **gold** sol.

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